Alaska Communications

CAF II Model
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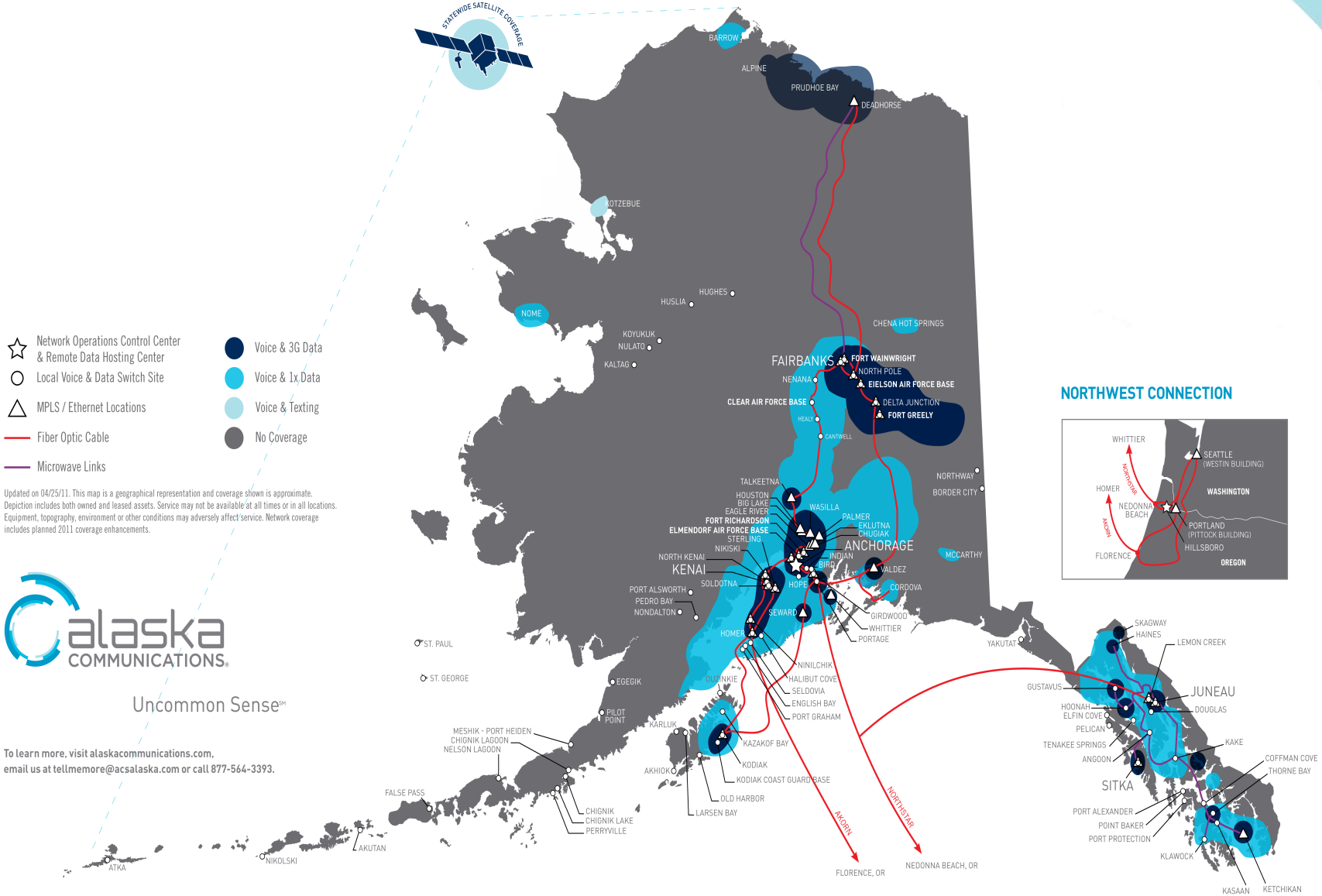
Alaska Communications Systems

- ACS operates four ILECs in six study areas, serving about 120,000 access lines, down from a peak of about 257,000 in 2001
  - More than half are in the Anchorage study area, the remainder distributed across five rural study areas
  - ACS central offices serve anywhere from 12 to 23,000 households, but 75% of its local serving areas serve fewer than 1,000 households
  - More than half of ACS's local serving areas are in the Alaska "Bush" not reachable by road
  - The ACS ILECs will receive about $19 million in frozen support this year
- ACS provides backhaul connectivity to other carriers, such as mobile telecommunications and broadband service providers, in many parts of the state
- ACS also operates two submarine cables providing long-distance voice and broadband connectivity between Alaska and the nearest Internet access points in Oregon and Washington state

Alaska Communications Service Territory



Why an ACS Model?

- FCC modeling process is intended to estimate forward-looking costs, at a granular level, for efficient wireline-based providers to deploy, operate and maintain fixed voice and broadband networks in high-cost areas, including Alaska
- If the model adopted cannot accurately predict the costs of serving remote and insular areas such as Alaska, and ensure sufficient support, the Bureau may exempt such areas from CAF Phase II
- ACS believes that Alaska-specific costs have not been captured, and that current modeling underestimates support for ACS LECs
- ACS cannot meet increased obligations with reduced support under CAF II

Major Cost Differentials Affecting Broadband Deployment in Alaska

- Lack of middle mile connectivity to many communities
- Distance to nearest network aggregation point
- Distance to nearest Internet access point (out of state)
- Geographic scale -- loop lengths and cost of transport
- Lack of road access
- Lack of power access
- Sparse population
- Short construction season
- Terrain & weather
- Labor constraints
- Take rate in Alaska

ACS Has Undertaken To Model Costs Not Captured By CQBAT Model

- Utility of cost model depends on its ability to capture variations in cost between companies and between locations
- ACS modeled major categories of costs not captured by CQBAT Model:
  - CQBAT assumes fiber-based middle mile transport, many AK locations dependent on satellite or microwave for middle mile
  - CQBAT assumes a regional Internet access point within the same LATA as the ILEC; all traffic originating in Alaska must be transported 2,000 miles or more by undersea cable to nearest Internet access point in Washington or Oregon
  - CQBAT assumes ubiquitous road system, power grid; many off-road AK locations impacted by higher installation & maintenance costs
- Additional work is needed to model Alaska-specific differences in a number of input variables, including:
  - Loops and fiber transport
  - Central office equipment (*e.g.,* switches in very remote locations)
  - Installation and maintenance costs
  - Labor costs

Alaska-Specific Cost Variables Modeled by ACS

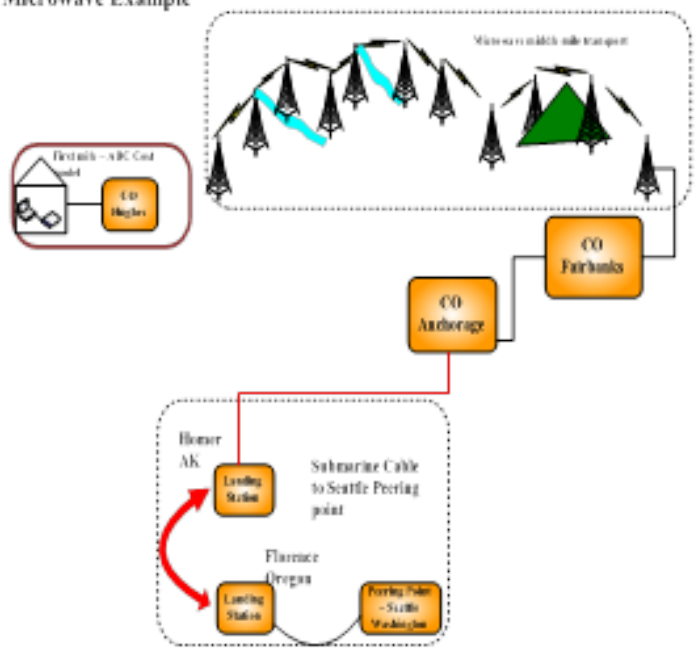
- Middle mile transport (from the SWC to the nearest network aggregation point on a fiber ring) via non-fiber based facilities modeled by ACS
  - In 63% of the communities served by ACS, point-to-point microwave or satellite required for transport
  - Lack of roads and power also a factor
  - Relatively few customers per link affect per-customer cost of middle mile transport
  - Costs generally exceed those of fiber-based middle mile in Lower 48

Alaska-Specific Cost Variables Modeled by ACS, continued

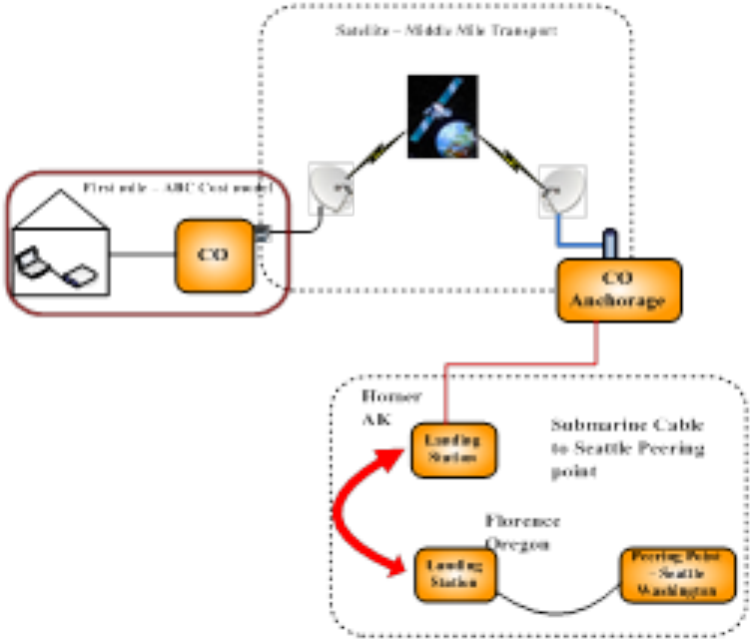
- Broadband transport costs modeled by ACS from nearest network aggregation point in Anchorage or Juneau to the nearest Internet access point in Oregon or Washington state
  - CQBAT assumes an Internet access point at the regional BOC tandem in the same LATA
  - Alaska is not part of any LATA, and has no tandem
  - Transport of Internet traffic by undersea fiber optic cable is a cost only for broadband providers serving insular areas such as Alaska

ACS Network Design

Microwave Example



Satellite Example



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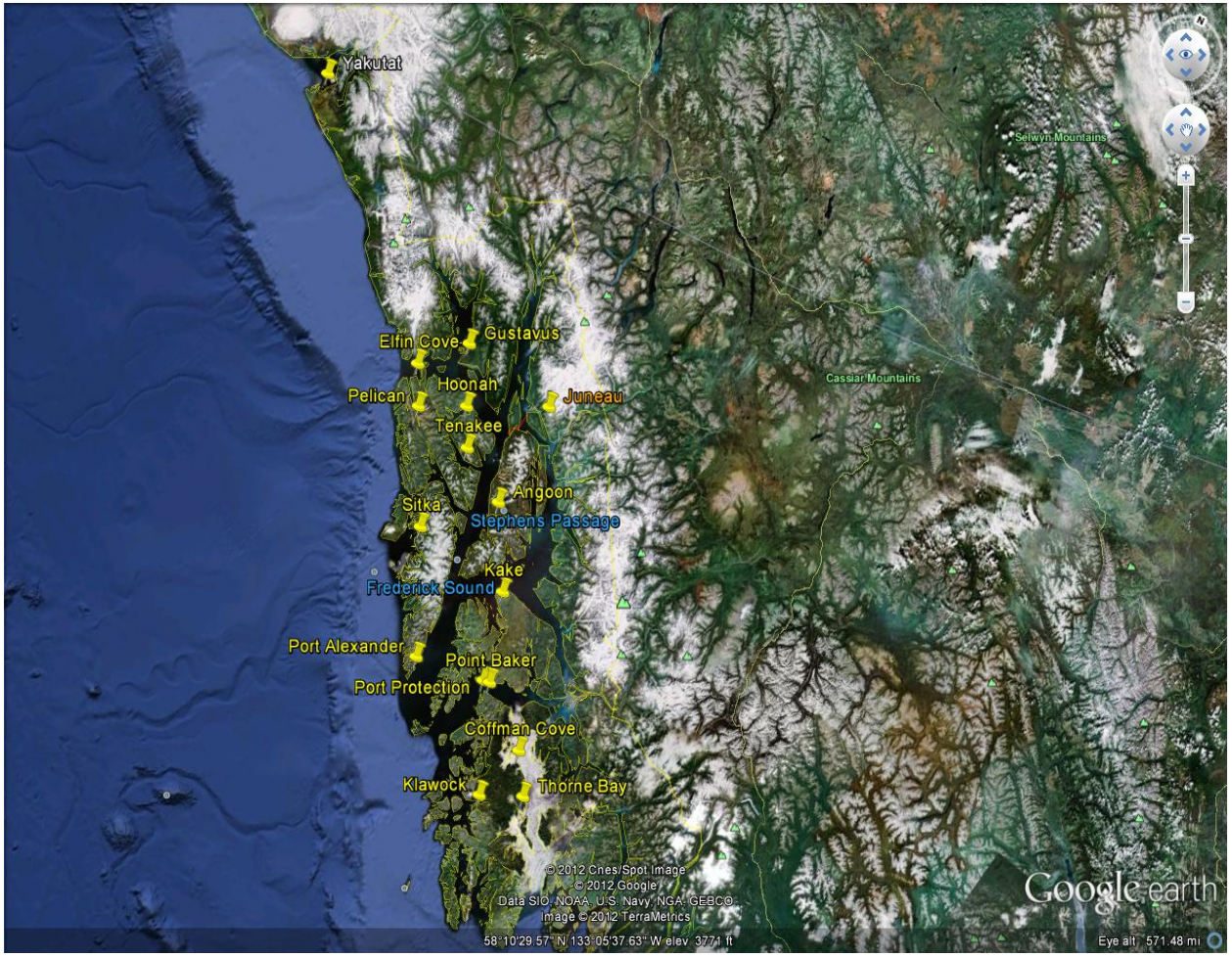
Alaska-Specific Cost Variables Yet To Be Modeled

- Above-average equipment, labor, transportation and energy costs
  - Many network sites are accessible only by air or heavy equipment; cost of diesel fuel alone can run $5 to $20 per gallon
  - Access to Nikolski, in the Aleutians, is only by air, via Dutch Harbor (double hop) from Anchorage – ACS has scheduled 5 service visits this year, and has been unable to reach the village due to weather and flight unavailability – at a cost of $54K and an average of 5 days per attempt, without reaching the destination
  - Replacing a single cable in Port Heiden cost $44K, required freighting materials and tools from Anchorage, diesel at $7 per gallon for heavy equipment, flying technicians (double hop) from Anchorage

Alaska-Specific Cost Variables Yet To Be Modeled, continued

- In Southeast Alaska, labor costs significantly add to the cost of facilities deployment and maintenance
  - Routine service visit to a remote site in southeast Alaska requires on average 21 hours beyond normal service call in Juneau or Sitka
  - 100 service visits to remote communities in southeast Alaska in first 8 months of 2012 required 2,100 labor hours above what would have been required in Juneau or Sitka; 2,800 extra hours forecasted for all of CY 2012
  - Work time required varies widely depending on weather (accessibility), time of year (short construction season), communications (lack of wireless coverage), access to materials (remote shipment)

ACS in Southeast Alaska



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Alaska-Specific Cost Variables Yet To Be Modeled, continued

- In southeast Alaska, ACS operates 15 exchanges serving an area about 200 by 400 miles with little road access
  - Exchanges configured with standalone CO, copper feeder and distribution cables, copper drops
  - Some exchanges rely on microwave, BETRs or Telular for local (last mile) distribution
  - Technicians in Juneau and Sitka reach remote SWC locations via aircraft plus small boat or ground transportation (4WD vehicle where roads exist, push cart for trails or boardwalk)
  - Regularly scheduled site visits subject to change due to severe weather conditions, larger-scale outages, staffing shortages
  - Installation and maintenance costs are increased 3-4 times on-road areas

Alaska-Specific Cost Variables Yet To Be Modeled, continued

- Longer loop and transport lengths, on average, than in the Lower 48
  - Loop portion of CQBAT model captures network facilities from the customer location to a central office, assumes fiber last mile facilities from the customer to the serving Feeder Distribution Interface, and fiber second mile facilities from the FDI to the CO
  - FTTd costs higher in AK due to longer loop and second mile distances
  - Even where SWC accessible via road system, middle mile fiber transport distance to nearest regional fiber ring much greater than in Lower 48
- Above-average CO costs in very remote locations
  - Soft switches are not an option due to lack of fiber middle mile
  - DSLAMs, routers serving very sparse population, raising per-locations costs
- ACS conservatively estimates that thousands of additional locations in Alaska would exceed lower benchmark if Alaska-specific costs were reflected in modeling

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ACS Model – Methodology

- The goal of this first ACS model was to capture satellite, microwave and undersea cable costs
- The level of investment was calculated to reflect the FCC's requirements for speed, capacity and latency
- Assumptions about broadband take rates are significantly lower than those used by CQ, consistent with subscribership in AK
- Return on capital based on FCC default
- Capital recovery based on FCC depreciation parameters

ACS Model – Methodology, continued

- ACS Model develops annual OpEx and CapEx factors to estimate the investment required and ratio of booked plant-specific expense to booked investment by plant category
  - Annual costs factors equal the ratio of expenses (by network function) to investment balance
  - Cost factors are applied to the estimated forward-looking investment balances to estimate forward-looking operating costs
  - Cost factors based on Part 32 Account Balance with ability to modify any factor calculation
- Expected broadband demand (customer locations multiplied by expected take rate) is divided into total annual cost to yield the per-customer cost

ACS Model – Methodology, continued

- The following inputs were developed:
  - Required bandwidth capacity at each local serving area
  - Customer location count, including business factor, for each local serving area:
    - U.S. Census Bureau household data, together with company records, used to determine the residential customer locations for each area
    - Number of business locations estimated based on company records and residential counts
  - Annual operating cost factors (carrying charges) used to develop forward-looking plant-specific operating costs
  - Middle mile (non-fiber) costs for areas not on road system
  - Long-haul transport cost to L48 Internet access point

ACS Model – Methodology, continued

- Middle mile transport (terrestrial fiber, microwave or satellite) chosen by ACS engineers based on most efficient configuration:
  - Satellite cost based on lease rate recently negotiated by ACS plus the estimated forward-looking cost required to provision the equipment necessary to bring the signal from the earth station to CO
  - Microwave cost includes required equipment and installation expressed on a per-unit basis (per foot, per port, etc.)
    - For each local service area where microwave transport is selected, ACS engineers quantified the costs of materials and equipment required to provision microwave transport at required bandwidth capacities
    - Equipment costs reflect purchase costs that assume all applicable ACS discounts plus installation costs
    - Installation costs include both contract/vendor labor costs, as well as allowances for Company engineering and technician time
  - In some communities, a combination of fiber and short haul marine cable is the most efficient configuration

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ACS Model – Methodology, continued

- Internet Transport:
  - Bringing traffic from Alaska to the nearest Internet access point requires routes over undersea cables that connect Alaska to the Lower 48
  - Efficient network configuration requires redundant routing -- ACS model includes the costs needed to utilize undersea cables terminating in Seattle and Portland
  - Relevant costs of these facilities include undersea cable capacity to and including landing stations, as well as terrestrial fiber transmission from coastal landing stations to IAP in Seattle or Portland
  - Capacity requirements based on assumptions consistent with FCC rules:
    - 4 Mbps downstream and 1 Mbps upstream speeds
    - number of customer locations multiplied by take rate consistent with ACS experience

- Using CapEx, OpEx data from current ACS undersea cable records, ACS identified cost of provisioning and operating undersea cables capable of handling the required minimum capacity requirements

ACS Model - Results

- The ACS Model produces output down to the census block level including:
  - Number households (customer locations)
  - Expected number of broadband customers
  - Required middle mile transport connection
  - Cost per location of middle mile transport
  - Cost per location of undersea cable transport
  - Total forward-looking broadband costs per location

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ACS Model – Results, continued

- The ACS Model indicates that costs to provide broadband service to unserved locations in ACS ILEC serving areas will exceed the costs estimated in the CQBAT model by a significant margin, in a number of locations by as much as several thousand dollars
- ACS estimates that the total cost to bring broadband to all unserved customer locations in ACS ILEC serving areas will be at least $75 to $100 million

Achieving Useful Model Outcomes

1. Unique Alaska circumstances must be included in the cost variables modeled for Alaska ILECs
   – non-fiber-based middle mile transport
   -- undersea cable-based Internet
   -- take rates reflective of actual market conditions
2. Algorithms and input variables employed in the model must be capable of reflecting differences in costs experienced in insular locations – For insular areas, area specific model superior to nation-wide model
3. Model must be transparent as to the assumptions, computations and inputs used
4. Parties must have real-time access to the model to verify outputs, change assumptions and run alternative inputs
5. The results of the model must be reasonable or the model itself cannot be deemed reasonable

Transparency

- All data, assumptions and computations should be provided so as to be verifiable
- Parties should be able to change input variables, test assumptions, and run sensitivity tests in real time, for example:
  - Changing loop lengths
  - Changing the technology (such as from fiber to microwave or satellite)
  - Changing engineering assumptions
  - Changing depreciation assumptions
- Parties should have access to source information for cost inputs (for equipment, the brand, model, capacity, age, and utilization rate)
- Parties should have the ability to evaluate changes in input variables such as:
  - Equipment cost input values
  - Labor rates and loadings
  - Cost of capital

Observations

- The ability of any national model to accurately estimate costs for Alaska is subject to the reasonableness of the input variables, including Alaska-specific costs for equipment acquisition, installation and maintenance
- In addition, any national model must be capable of accounting for unique regional features, such as long-haul fiber transport routes prevalent in Alaska
- ACS is receiving $19 million per year in high-cost support – the CQBAT model would *reduce* that by about $12 million per year, and eliminate it at the end of 5 years
  - Support for Alaska, Puerto Rico and the US Virgin Islands collectively would drop from $57.9 million to $8.8 million per year
- At the same time, LECs will be expected to increase broadband deployment to 85% of unserved locations in 3 years, and 100% of unserved locations in 5 years
- ACS estimates that the real cost of meeting this goal in the unserved portions of its LEC service territories is at least $75 to $100 million; another $50 to $75 million would be required to bring the FCC's target speeds to underserved locations
- If a model produces unreasonable results, the model cannot be deemed reasonable

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